

## Natural Resources Conservation Service New Hampshire



### NRCS, NH Fish and Game, and the Tin Mountain Conservation Center Teach How to Improve Water Quality and Native Brook Trout in NH Streams

*(NRCS offers financial assistance for wood-in-stream practices)*

*By Laura Chandler, NRCS Administrative Assistant*



On October 20<sup>th</sup> and November 9<sup>th</sup>, the Tin Mountain Conservation Center hosted wood-in-stream workshops that explored the ecological value and practice of adding large pieces of wood in NH's first order streams, with the goal of increasing the Eastern Brook Trout population, growing their size, and improving water quality.

Dick Fortin, Forester with Tin Mountain Conservation Center, explained that Brook Trout need ideal habitat to live and thrive and currently only 5% of its original habitat remains intact in the northeast. Over time, logging and agriculture has resulted in a lack of wood in streams. When large trees fall into streams, they create pools ideal for Brook Trout to spawn, feed and grow.

The deeper the pool, the better the habitat, particularly in the winter. Organic material collects in the pools and nutrient and sediment loss slows. Flood plains connected with streams are covered with fertile biomass during high water events thanks to wood in streams.

In 2010, Tin Mountain partnered with NRCS to put wood in first-order streams (18" wide or less) along the Beebe River. Survey teams assessed the percentage of wood in streams and determined if the wood was stable, rooted, attached, or in decay. They also inventoried the wood for species, size, and insects. They counted, weighed and measured the fish, along with monitoring water temperature. They used electrofishing techniques to get a baseline of the Brook Trout population prior to putting wood in the streams. Electrofishing uses direct current electricity flowing between a sub-merged cathode and anode. This affects the movement of the fish so that they swim towards the anode where they can be caught and counted. Electrofishing is a common scientific survey method used to sample fish populations to determine abundance, density, and species composition. When performed correctly, electrofishing results in no permanent harm to fish, which return to their natural state in as little as two minutes after being caught.





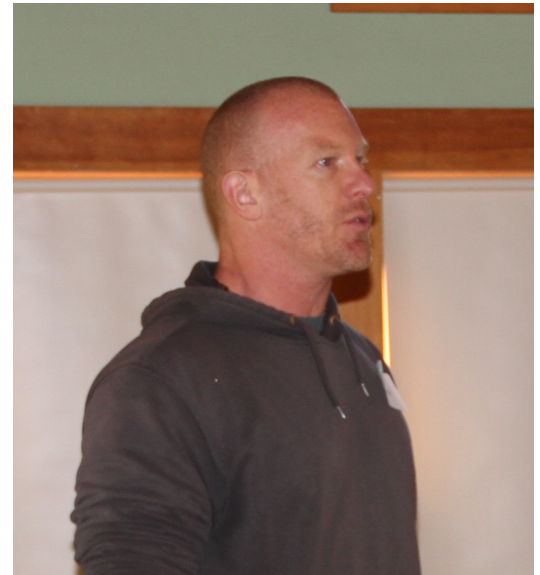
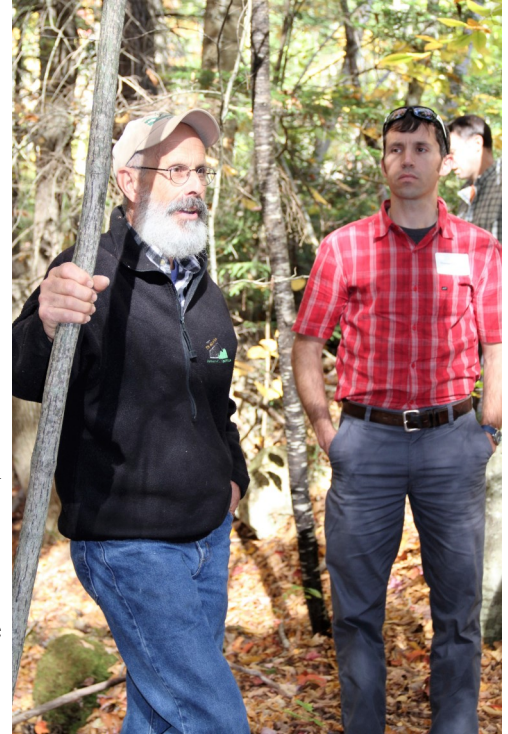
## Natural Resources Conservation Service New Hampshire



Wood is added to streams to mimic a natural setting. Log jams are placed to create a pool or add cover. Sediment is trapped and provides habitat for macroinvertebrates (trout food). Different fish feed in different water flows, so it was important to study the best flow for Brook Trout. The method of putting wood in streams is to cut hemlock, white ash, and beech using a ‘chop and drop’ method. Ideally, a tree will fall in exactly the right place in the stream, but that is rare. Usually logs must be carried to the stream and properly placed. Fortin said, “when choosing wood to cut, consider size, the ease of taking it down, any existing downed material, and the impact on the shoreline and loss of shade”. He also explained how to acquire dredge and fill permits when doing some of this work. He said he prefers to cut trees that are already in contact with the water. One concern is beaver activity that can undermine the wood-in-stream practice.

John Magee of NH Fish & Game has a goal of increasing the number and size of trout in NH streams. He echoed that instream wood is good because it retains organic material (leaves, twigs). Wood forms most of the stream pools, where algae blooms grow due to trapped phosphorous, adding nutri-

ents. In 2007, Fish and Game and UMass Amherst worked on the Nash Stream Forest weighing and tracking trout using pit tags, which are about the size of a grain of rice, inserted inside the fish. They used clove oil to stun the fish to insert the pit tags for tracking. In Johnson Brook, they electrofished, studied fast flowing shallow water, riffles, pools and falls, as well as studied logs and wood jams. In Emerson Brook they controlled the mount of added wood, and allowed sunlight to grow more algae, resulting in the retaining of more nutrients. They discovered that within 5 years, there were four times more fish and the fish were four times larger where wood was added.





## Natural Resources Conservation Service New Hampshire



Nels Liljedahl, NRCS NH District Conservationist gave an overview of NRCS financial assistance programs and how they are used to implement wood-in-stream projects. He explained the differences in the various NRCS programs and how they can be used to protect and improve NH's streams by providing technical and financial assistance to landowners. In response to a question, Liljedahl explained that the impact of this practice on other macroinvertebrates and amphibians has not yet been assessed. He also explained the importance of a forest management plan that includes installing buffers along first-order streams to encourage growth and decay that will allow trees to fall into streams naturally.

One part of the training included a tour of a wood-in stream practice area where the group was told that a lot of little pieces of wood appear to block fish passage, but the fish can maneuver through small openings. Brook Trout travel 200 hundred feet a day, on average, and sometimes 1,000 feet a day to spawn in mid-September. Wood-in

-stream work should not be one during or after spawning because the added changes in the water level is detrimental to the eggs.

Cold water streams are ideal for this practice. First-order streams, like one viewed on the tour, provide cooler habitat for Brook Trout in the summer. "Remember that riffles can be turned into a series of step pools that are great for Brook Trout", Fortin said. "Try to mimic nature when using the in-stream wood process wherever possible and remember to consider tree, road and stream orientation so you don't divert water toward the road".

